

US EPA ARCHIVE DOCUMENT

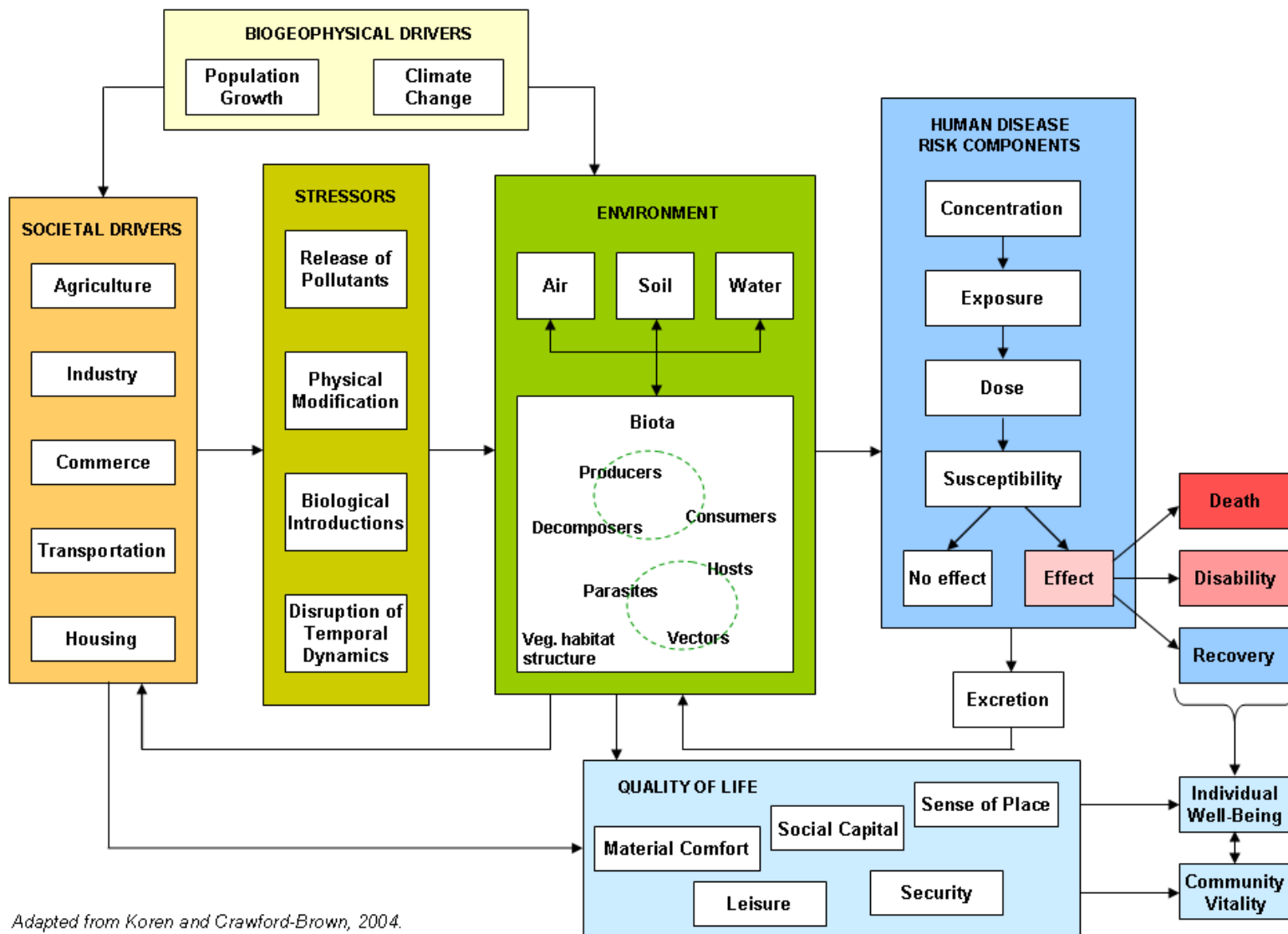
# Potential Multiple Benefits (and Dis-Benefits) of Near-Road Vegetation



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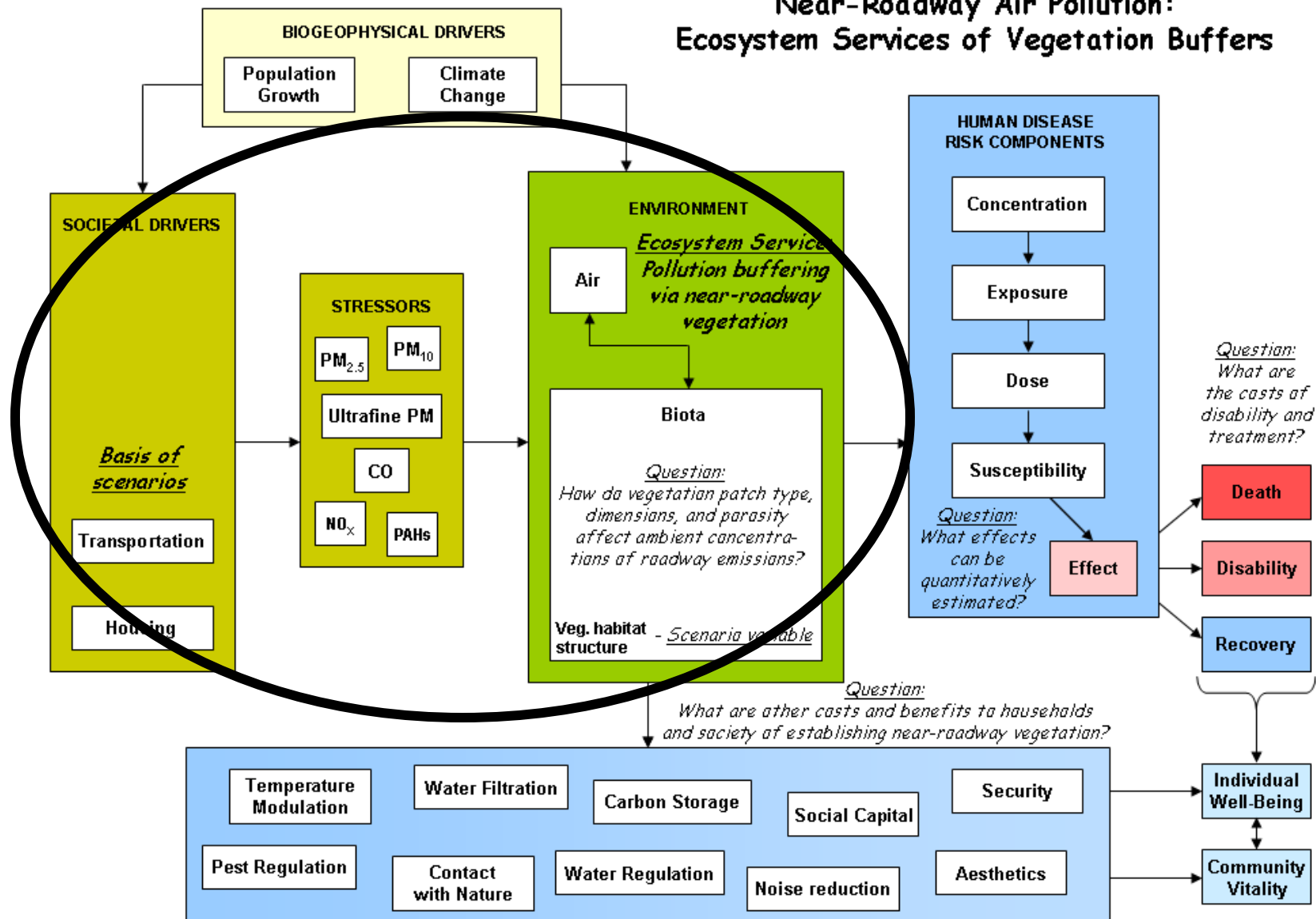
**April 27, 2010**

## What is the Role of Ecosystems in Human Health and Well-Being?



Adapted from Koren and Crawford-Brown, 2004.

## Near-Roadway Air Pollution: Ecosystem Services of Vegetation Buffers

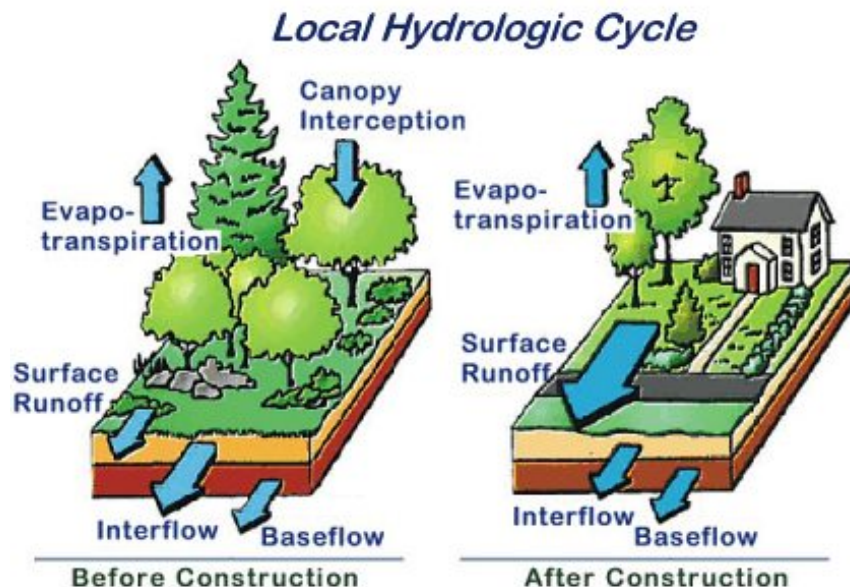


## Potential Additional Benefits to Human Health and Well-Being

- Temperature modulation – reduces urban heat-island effect
- Water regulation – modulates flooding and droughts
- Water filtration – reduces sediments and toxins



Tools for assessing and managing  
Community Forests



## Benefits Can Also Apply to Sensitive Wildlife Species





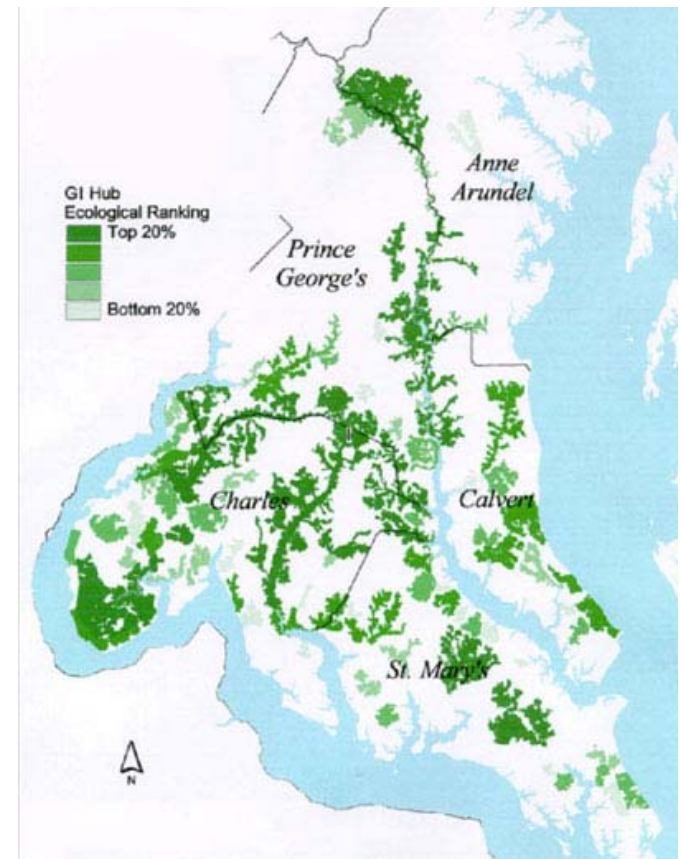
## Potential Additional Benefits to Human Health and Well-Being, cont.

- **Aesthetic improvement** – increases quality of life, property values
- **Noise reduction** – ditto
- **Promotion of physical exercise** – multiple health benefits
- **Contact with Nature** – increases healing, cognitive development; relieves depression, ADD/ADHD symptoms; fosters community ties (social capital); extends life



## More Societal and Ecological Benefits...

- Carbon storage – mitigate global warming
- Reduce air conditioning – ditto, and save \$\$
- Connect nature preserves through corridors – increase resilience of wildlife populations





## Potential Societal and Ecological Dis-Benefits

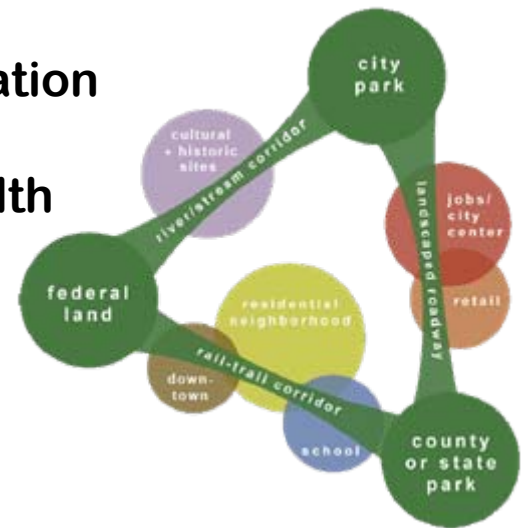
- May provide corridors for fire, invasive pests, crime
- May increase pollen load
- May result in net water loss
- May increase sprawl
- How healthy are trees and soils used as pollutant buffers?



***Buffer Design and Species Selection are Critical to Minimize Dis-Benefits***

## Potentially Affected Programs

- Urban planning
- Urban forestry
- Parks and recreation
- School siting and design
- Low-income housing
- Military family housing
- Elder-care facilities
- Correctional services
- Public safety (police and fire)
- State Dept. of Natural Resources
- Animal control
- Public utilities
- Transportation
- Public health
- Hospitals
- et al. ...?



*Maximizing Benefits and Minimizing Dis-Benefits Requires Cross-Program Coordination*

## Closing Thoughts...

### Gaps in meeting research and policy needs

- Health effects of reducing ambient pollutant conc. (dose-response curves)

### Existing information, but little depth

- Corridor designs to maximize benefit : dis-benefit ratios

### Promising new approaches to be further tested

- Valuation of multiple ecosystem services and trade-offs from alternate decisions

### Avenues for communicating research and policy issues

- Children's health
- Environmental justice
- Green infrastructure
- Smart growth / brownfields redevelopment
- Climate change mitigation & adaptation